REMARKS

Claims 1-15 are pending.

The amendments to the specification and the claims correct minor spelling or grammatical irregularities and do not introduce new matter.

Claims 1-11 are rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent Application No. 2002/0094931 A1 (Wang) on the ground that the catalyst of Wang would have the characteristics claimed in claims 1-11. This rejection should be withdrawn for the failure of Wang to teach using Applicant's treated beta zeolite.

As a preliminary matter, for purposes of this Reply and Amendment only, and without intending to be bound to any particular interpretation of Wang, Applicant considers "zeolite P" and "zeolite p" in Wang as meaning "zeolite beta". See, for example, "zeolite P" or "zeolite p" at paragraphs [0005], [0012], [0023], [0027], [0028], [0034], [0067], [0068], and [0104].

Applicant discloses a hydrocracking process that uses a catalyst with increased selectivity to middle distillates. See page 1, lines 4-6; page 2, lines 13-14; page 6, lines 24-26; page 7, lines 10-12 and 23-27; page 14, lines 1-5; and claim 1. The catalyst comprises beta zeolite. The beta zeolite has a unit cell size parameter "c" value of 26.10 to 26.20. In claims 1-7, less than 17 percent of the total aluminum in the beta zeolite is tetrahedral aluminum as determined by nuclear magnetic resonance (NMR), while in claims 8-11 the beta zeolite has between 10 to 15 percent tetrahedral aluminum by NMR. The middle distillate yield advantage is clearly correlated with a unit cell size parameter "c" value of 26.10 to 26.20. See Figure 2. Decreasing the tetrahedral aluminum as determined by NMR below 17 percent also shows a strong correlation with better yield. See Figure 1. Applicant's invention is based on the discovery that the selectivity of a middle distillate hydrocracking catalyst containing beta zeolite can be increased by steaming the zeolite under conditions which reduce its acidity to certain low values. See page 4, lines 17-27.

In contrast, Wang has two objectives – increased selectivity to middle distillates and increased activity. See paragraphs [0009] and [0010], for example. Wang states that a single zeolite cannot accomplish both goals, but a combination of zeolites can. See paragraph [004]. This different focus led Wang to invent a catalyst comprising two zeolites – Y and beta. See the abstract;

paragraphs [0004], [0011], [0041], [0045], and [0098] through [0101]; and claims 1 and 28. Wang states that zeolite Y alone cannot achieve both increased selectivity and increased activity. See paragraph [008]. See also paragraphs [0103] and [0106], where catalyst E, which contains only zeolite Y, has lower selectivity to middle distillates and lower activity (higher reaction temperature) than Wang's catalyst A, which contains both zeolites Y and beta. Wang fails to teach using zeolite beta alone.

Although Wang teaches steaming beta zeolite at a temperature of 500°C-800°C (See paragraph [0031].), Wang's beta zeolite would not necessarily have and does not appear to have the characteristics of the zeolite beta in Applicant's process. Before modification crystallized zeolite beta generally has a silica/alumina ratio of 42-51. See paragraph [0028]. For argument's sake say the silica/alumina ratio is 50. Then the zeolite beta framework has 5000 moles of silica for every 100 moles of alumina. When the zeolite beta is treated so that 17 percent of the total aluminum is tetrahedral aluminum, 83 percent the alumina is removed from the framework and so only 17 moles of alumina would remain in the framework for every 5000 moles of silica. After treatment the framework silica/alumina ratio of the beta zeolite in Applicant's process would be 5000/17, or 294. If less than 17 percent of the total aluminum remains as tetrahedral aluminum, then the ratio would be even higher than 294. Wang's modified zeolite beta, in contrast, has a silica/alumina ratio of only 85-153. See paragraph [0011]. Therefore, Wang's beta zeolite would be different from the zeolite beta in claims 1-11.

Applicant hypothesizes that the most important changes in relation to hydrocracking catalyst selectivity for middle distillate production are related to the relative distribution of framework tetrahedral aluminum, octahedral extra framework aluminum and so-called penta-coordinated aluminum species, all of which result in acidity functionality. See page 7, lines 23-27.

Although Applicant's range of steaming temperature of from about 750°C to about 925°C in claims 8-11 slightly overlaps Wang's range of 500°C-800°C, identical steaming temperatures do not necessarily result in identical physical characteristics of the resulting zeolite beta. Differences in steaming equipment and procedures may subject particles to different levels of treatment. See page 20, line 23 to page 21, line 6. It is the physical characteristics of the treated beta zeolite that are important. See page 7, line 28 to page 8, line 5.

For all of these reasons, the rejection of claims 1-11 under 35 U.S.C. §102(e) as anticipated by Wang should be withdrawn.

Claims 1-11 are rejected under 35 U.S.C. §103(a) as obvious over Wang alone on the ground that it would have been obvious to a person of ordinary skill in the art to have modified the process of Wang by adjusting the steaming conditions of the zeolite beta and thereby arrive at Applicant's invention. This rejection should be withdrawn for the failure of Wang to suggest to a person of ordinary skill in the art a process using a hydrocracking catalyst without zeolite Y.

Claims 1-11 do not recite zeolite Y. But Wang explicitly states that its goal of increasing both selectivity and activity cannot be achieved using a single zeolite: "The activity and selectivity to the middle distillates of a hydrocracking catalyst containing a *single* sort of zeolite can not be raised to a maximum extent due to the restriction of the sort of zeolite, while the activity and selectivity to the middle distillates of a hydrocracking catalyst containing *composites* of zeolites can be remarkably raised since the characteristics of various sorts of zeolites may be fully developed and synergetic catalysis may occur." See paragraph [0004] (Emphasis added.). Wang fails to teach or suggest using zeolite beta alone. All of the catalysts that Wang teaches use zeolite Y. Therefore, it would not be obvious to a person of ordinary skill in the art to eliminate zeolite Y from the catalyst used in Wang's process and thereby arrive at the processes of claims 1-11, because to do so would destroy the clear intent, purpose, and function of the process disclosed in Wang. For this reason, the rejection of claims 1-11 under 35 U.S.C. §103(e) as obvious over Wang should be withdrawn.

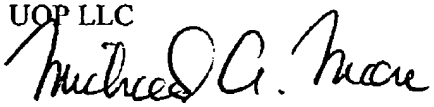
Claims 12-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wang in view of U. S. Patent No. 4,820,402 (Partridge), on the ground that it would have been obvious to use silica-alumina and/or alumina in the amounts taught in Partridge in the catalyst used in Wang's process and thereby arrive at Applicant's invention. This rejection should be withdrawn for the failure of Wang in combination with Partridge to suggest to a person of ordinary skill in the art a process using a hydrocracking catalyst without zeolite Y. Even if a person of ordinary skill in the art combined Partridge's teachings on the amounts of silica-alumina and/or alumina with the teachings of the process of Wang, such a person would arrive at a process that uses two zeolites, Y and beta. A person of ordinary skill in the art would not arrive at the process claimed in claims 12-15 unless that person modified Wang to eliminate the use of zeolite Y. But eliminating the use of

zeolite Y would destroy the clear intent, purpose, and function of the process disclosed in Wang. Therefore, the rejection of Claims 12-15 as being as being unpatentable over Wang in view of Partridge should be withdrawn.

In view of the foregoing remarks, the subject application is now believed to be in a condition for an allowance of all claims and such action is respectfully requested.

This is intended to be a complete response to the Office action. If any matter remains which can be easily addressed, the Examiner is invited to call to resolve the issues.

Respectfully submitted,
UOP LLC



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